A

PAT-NO: JP407059553A

DOCUMENT-IDENTIFIER: JP 07059553 A

TITLE: TURBID LIQUORS

PUBN-DATE: March 7, 1995

INVENTOR-INFORMATION:

NAME	COUNTRY
NAGAO, MASAAKI	
SATO, YOKO	

ASSIGNEE-INFORMATION:

NAME	COUNTRY
MANZUWAIN KK	N/A

APPL-NO: JP05232205

APPL-DATE: August 26, 1993

INT-CL (IPC): C12G003/04

ABSTRACT:

PURPOSE: To obtain turbid liquors having fruity flavor derived from a fruit juice without deteriorating the turbidity even by preservation for a long period without using a synthetic clouding agent.

CONSTITUTION: The turbid liquors having ≤0.001 U/ml pectinase activity are obtained by mixing liquors such as SAKE (Japanese rice wine), SHOCHU (low class distilled spirit), whisky, brandy, liqueur, spirits and beer with a turbid fruit juice and thermally pasteurizing the resultant mixture at 85-95°C for 30-90sec.

RALPH
MCELROY TRANSLATION
COMPANY

February 10, 2004

Re: 6786-96815

To Whom It May Concern:

This is to certify that a professional translator on our staff who is skilled in the Japanese language translated the enclosed Kokai Patent Application No. 7[1995]-59553 from Japanese into English.

We certify that the attached English translation conforms essentially to the original Japanese language.

Kim Vitray
Operations Manager

Subscribed and sworn to before me this 10th day of February, 2004.

TINA WUELFING
Notary Public
State of Texas
My Commission Expires
December 8, 2007

Tina Wuelfing
Notary Public

910 WEST AVE.
AUSTIN, TEXAS 78701
www.mcelroytranslation.com

(512) 472-6753
1-800-531-9977
FAX (512) 472-4591

Job No.: 6786-96815 Ref.: 10047-KINTARO
Translated from Japanese by the Ralph McElroy Translation Company
910 West Avenue, Austin, Texas 78701 USA

JAPANESE PATENT OFFICE
PATENT JOURNAL (A)
KOKAI PATENT APPLICATION NO. HEI 7[1995]-59553

Int. Cl.[6]: C 12 G 3/04

Filing No.: Hei 5[1993]-232205

Filing Date: August 26, 1993

Publication Date: March 7, 1995

No. of Claims: 7 (Total of 5 pages; FD)

Examination Request: Not filed

TURBID LIQUOR

Inventors: Masaaki Nagao
777-12 Nanokaichi
Yamanashi-shi
Yamanashi-ken

Yohko Satoh
1150 Manriki
Yamanashi-shi
Yamanashi-ken

Applicant: 390032193
Manzuwain Co., Ltd.
1-25 Nishiki-cho
Kanda, Chiyoda-ku
Tokyo

[There are no amendments to this patent.]

Abstract

Objective

The objective of the present invention is to produce turbid liquors having a fruity flavor derived from fruit juice without deterioration of the turbidity even after a long storage period without using a synthetic clouding agent.

Constitution

Liquors such as sake, shochu, whiskey, brandy, liqueur, spirits and beer are mixed with a turbid fruit juice and the mixture produced is thermally pasteurized at 85-95°C for 30-90 sec to produce a turbid liquor having a pectinase activity of 0.001 U/mL or below.

Claims

1. Turbid liquors produced by mixing a turbid fruit juice with liquors having a pectinase activity of 0.001 U/mL or below.

2. Turbid liquors produced by mixing liquors having a pectinase activity of 0.001 U/mL or less and a turbid fruit juice having a pectinase activity of 0.001 U/mL or less.

3. The turbid liquors described in Claim 2, in which the turbid fruit juice is produced by immediate thermal pasteurization of a fruit juice made from crushed fruit at 85-95°C for 30-90 sec.

4. The turbid liquors described in Claim 2, in which the liquors are produced by filtering through an ultrafiltration membrane of differential molecular weight of 50,000 or below.

5. The turbid liquors described in Claim 2, in which the liquors are produced by thermal pasteurization at 85-95°C for 30-90 sec.

6. Turbid liquors produced by mixing a turbid fruit juice with a liquor and thermally pasteurizing at 85-95°C for 30-90 sec.

7. The turbid liquors described in Claim 1-6, in which the turbid liquor is one selected among the group of sake, shochu, whiskey, brandy, liqueur, spirits and beer.

Detailed explanation of the invention

[0001]

Industrial application field

The present invention pertains to the production of turbid liquors having a fruity flavor derived from fruit juice without causing a reduction in the turbidity even after storage for a long period without using a synthetic clouding agent.

[0002]

Prior art

Method for production of turbid liquors consisting of adding a clear fruit juice to a liquor and further adding a clouding agent is known in the past.

[0003]

Problems to be solved by the invention

However, the aforementioned method lacks turbidity in juices derived from some fruit. Furthermore, taste and smell not based on the raw materials but based on a clouding agent is noted.

[0004]

Means to solve the problems

As a result of much research conducted by the present inventors in an effort to eliminate the above-mentioned existing problems and to produce a new type of turbid liquors, the present invention was accomplished. Thus, the present invention is a turbid liquor produced by mixing a turbid fruit juice with a liquor having a pectinase activity of 0.001 U/mL or below, and furthermore, the present invention is a turbid liquor produced by mixing liquors having a pectinase activity of 0.001 U/mL or less and a turbid fruit juice having a pectinase activity of 0.001 U/mL or less, and furthermore, the present invention is a turbid liquor produced by mixing a turbid fruit juice with a liquor and thermally pasteurizing at 85-95°C for 30-90 sec.

[0005]

The present invention is explained in further detail below. As a method for production of turbid liquors having a pectinase activity of 0.001 U/mL or less, (a) a method consisting of mixing a liquor and a turbid fruit juice each having a pectinase activity of 0.001 U/mL or less, and (b) a method consisting of mixing a turbid liquor and a turbid fruit juice each produced in the conventional manner and thermally pasteurizing at 85-95°C for 30-90 sec, can be mentioned. It should be noted that the term "liquors" used in the present invention means a liquor with the exception of fruit wines; for example, sake, shochu, whiskey, brandy, liqueur, spirits, beer, etc., can be mentioned.

[0006]

For liquors having pectinase activity of 0.001 U/mL or less used as the raw material for production of the turbid liquor based on the above-mentioned method (1) [sic], liquors obtained by thermally pasteurizing liquors prepared conventionally at 85-95°C for 30-90 sec or turbid liquors obtained by passing the liquors prepared conventionally through an ultrafiltration membrane of differential molecular weight of 50,000 or below, or distilled liquors such as shochu, whiskey, brandy, liqueur, and spirits can be mentioned, and for other raw materials of turbid fruit juices having pectinase activity of 0.001 U/mL or less, a turbid fruit juice obtained by

immediately thermally pasteurizing a fruit juice of crushed fruit at a temperature of least 85°C, preferably 85-95°C for at least 30 sec, preferably 30-90 sec, can be mentioned.

[0007]

In this case, the thermal pasteurization conditions used for production of the turbid liquors according to the above-mentioned method (b) (at least 85°C and at least for 30 sec) is important, and when standard thermal pasteurization conditions (60-70°C for 1-30 min) is used, a trace amount of pectinase activity remains in the product after thermal pasteurization and slow clarification takes place when a turbid fruit juice is mixed with the aforementioned product and it eventually becomes transparent, and the stable long-term turbidity of the present invention cannot be achieved.

[0008]

Effect of the invention

The pectinase based on the fruit juice is deactivated essentially to 0 in the turbid liquor of the present invention; thus, high turbidity based on the fruit can be retained for a long time. Furthermore, when at least 3 vol%, preferably, 5-30 vol%, of turbid fruit juice made from grapes, peaches, plums, apples, pineapples, bananas, pears, apricots, Japanese plums, citrons, cranberries, strawberries, etc., is used, the product reflects the fruity flavor of the aforementioned raw materials and color of the raw materials and a turbid liquor with attractive color can be produced.

[0009]

The present invention is explained further in specific terms with application examples below.

Application Example 1

Sake was produced according to a standard sake production method. Meanwhile, a turbid fruit juice was produced with grapes from the Koshu district in the conventional manner. Furthermore, 10% (V/V) of the turbid fruit juice was mixed with the aforementioned sake and heated under the thermal pasteurization conditions shown in Tables 1 and 2; then, the temperature was maintained at approximately the effective temperature of pectinase (45°C) for 3 h and production of a first turbid liquor listed in Table 1 was achieved. Subsequently, the turbid liquor was stored at 35°C for 10 days (corresponding to 30 days at room temperature), and the turbidity of the final turbid liquor (after 10 days) was measured (Table 2). Furthermore,

reduction of turbidity based on the pectinase remaining in the turbid liquor after thermal pasteurization was examined. The results obtained are shown in Tables 1 and Table 2 below.

[0010]

Meanwhile, in order to estimate the degree of pectinase activity in each sake after providing the standard thermal pasteurization used in production of conventional sake, a pectinase agent with a known activity level was added to the turbid liquor while completely deactivating the pectinase by heating at 90°C for 1 min to form each concentration listed in Table 3, and retaining at 45°C, which is the optimum effective temperature for pectinase, for 3 h and turbidity was measured. The results obtained are shown in Table 3 below.

[0011]

In this case, the turbidity shown in the table was obtained as centrifugal separation was carried out for the turbid liquors and the absorption of a 10-mm cell was measured at 660 nm using a photoelectric spectrophotometer of Hitachi Co. Furthermore, the pectinase activity was measured according to the Somogy-Nelson method, and sodium polygalacturonate was used as a matrix, and the amount of enzyme that generates D-galacturonic acid at 1 micromole per min when reacted at 35°C is shown as 1 unit (U/mL) (see "Agricultural Chemistry Test Report (Vol. 2)," Agricultural Chemistry Class of Agricultural Department of University of Kyoto, Industrial Library Co., publication date, October 20, 1967, pp. 616-618 for reference).

[0012]

Table 1

①	55℃			60℃			65℃			85℃			95℃		
	① 分	② 初発濁度		① 分	② 初発濁度		① 分	② 初発濁度		① 分	② 初発濁度		① 分	② 初発濁度	
	5	0.005	×	1	0.011	×	1	0.153	○	0.1	0.051	○	0.1	0.082	○
	10	0.008	×	3	0.012	×	3	0.152	○	0.5	0.039	○	0.5	0.083	○
	20	0.026	×	5	0.035	△	5	0.154	○	1.0	0.053	○	1.0	0.062	○
	30	0.048	△	10	0.046	△	10	0.155	○	1.5	0.059	○	1.5	0.052	○

③ (注1) ×：濁明、△：完と透明、○：半透明～程度

Key: 1 min
2 Initial concentration
3 X: transparent, Δ: almost transparent, ☒: semi-transparent to transparent

[0013]

Table 2

①	55℃			60℃			65℃			85℃			95℃		
	① 分	② 最終濃度		① 分	② 最終濃度		① 分	② 最終濃度		① 分	② 最終濃度		① 分	② 最終濃度	
	5	0.002	×	1	0.003	×	1	0.001	×	0.1	0.049	○	0.1	0.053	○
	10	0.002	×	3	0.003	×	3	0.008	×	0.5	0.052	○	0.5	0.054	○
	20	0.005	×	5	0.006	×	5	0.010	×	1.0	0.053	○	1.0	0.054	○
	30	0.005	×	10	0.006	×	10	0.010	×	1.5	0.053	○	1.5	0.054	○

③(注) ×：透明、△：殆ど透明、○；半透明～透明

Key: 1 min
2 Final concentration
3 X: transparent, Δ: almost transparent, ☒: semi-transparent to transparent

[0014]

Table 3

① 項目 / ④ 試料区分	ペクチナーゼ活性 ② (U/ml)	濁度 ③ 濁度 ⑤
1	1.2	0.005
2	0.6	0.005
3	0.12	0.007
4	0.08	0.008
5	0.012	0.018
6	0.008	0.025
7	0.0012	0.045
8	0	0.051

Key: 1 Item
2 Enzyme activity (U/mL)
3 Turbid liquor
4 Sample division
5 Turbidity

[0015]

When comparison is made between Tables 1 and 3, and when the pectinase activity of turbid liquors corresponding to the turbidity is derived based on the turbidity of the heat treatment at 55°C for 10 min (0.008) or the turbidity of the heat treatment at 60°C for 1 min (0.011) in Table 1 and the closest turbidity of Table 3 (0.008) of the aforementioned turbidity, said activity is in the range of 0.08 to 0.012 U/mL. In other words, based on Tables 1 and 3, at the thermal pasteurization conditions commonly used in the conventional manufacture of sake, for example, a treatment at 55°C for 10 min or 60°C for 1 min, a pectinase activity of 0.08-0.012 U/mL remains. Furthermore, as shown by the results in Tables 1, 2 and 3, a pectinase activity of 0.08 to 0.012 U/mL remains under the standard thermal pasteurization conditions commonly used in production of conventional sake, for example, a treatment at 55°C for 10 min or 60°C for 1 min, when 10% (V/V) of a turbid fruit juice is mixed with sake; thus, even when the initial turbidity is sufficiently high, the turbidity decreases slowly with time and retention of turbidity is

not possible. Furthermore, when a heat treatment is provided for the turbid liquor produced by mixing the above-mentioned sake with a turbid fruit juice at 85-95°C for 6-90 sec, a turbid liquor with a pectinase activity of 0.001 U/mL or less can be produced and turbidity can be retained after bottling and storage for a long period of time.

[0016]

Application Example 2

For raw materials, 1. grapes from the Koshu district, 2. peach and 3. plum were used, and fruit juice obtained by crushing and pressing the fruits was immediately heated at 90°C for 1 min and the enzyme in the fruit juice was completely deactivated to produce turbid fruit juice. Meanwhile, shochu was produced conventionally (absence of pectinase activity). Subsequently, mixing was done for the above-mentioned shochu without pectinase activity and a turbid fruit juice at a volume ratio of 9:1 to produce a turbid shochu. Furthermore, a pectinase agent with known activity level was added to the aforementioned so as to form the concentration listed in Table 4, and retained at 20°C for 15 h, and the change in turbidity of the turbid liquor based on the pectinase included in the shochu was examined. The results obtained are shown in Table 4 below.

[0017]

Table 4

①項目	酵素活性 ②	ぶどう ③		白桃 ④		プラム ⑤	
⑥区分	(U/ml)	⑦濁度	⑧結果	⑦濁度	⑧結果	⑦濁度	⑧結果
⑨1比較例	1.2	0.003	×	0.010	×	0.004	×
2比較例	0.6	0.003	×	0.015	×	0.005	×
3比較例	0.3	0.003	×	0.021	×	0.008	×
4比較例	0.12	0.010	×	0.030	×	0.013	×
5比較例	0.06	0.027	×	0.045	×	0.018	×
6比較例	0.012	0.038	×	0.055	×	0.021	×
7比較例	0.006	0.041	×	0.060	×	0.025	×
⑩8本発明	0.0012	0.050	△	0.068	△	0.045	△
9本発明	0.0006	0.060	○	0.070	○	0.062	○
10本発明	0.00012	0.050	○	0.071	○	0.053	○
11本発明	0.00006	0.062	○	0.072	○	0.065	○
12本発明	0	0.062	○	0.072	○	0.065	○

⑪ (注1) ×；透明、△；殆ど透明、○；半透明～透明

Key:
1 Item
2 Enzyme activity (U/mL)
3 Grapes
4 Peaches
5 Plums
6 Division
7 Turbidity
8 Results
9 Comparative Example
10 Present invention
11 (Note 1) X: transparent, Δ: almost transparent, ○: semi-transparent to transparent

[0018]

As shown in the results in Table 4, when the pectinase activity is 0.001 U/mL or above, the turbid liquor slowly becomes clear, that is, the turbidity is reduced, and retention of turbidity is not possible; on the other hand, when the aforementioned value is 0.001 or below, the turbidity in the turbid liquor can be retained.